THE SCIENCE OF SURVIVAL

ACR ELECTRONICS

COBHAM

PRODUCT SUPPORT MANUAL

PLB-350C
406 MHz Personal Locator Beacons

Product No.: 2884 (AquaLink™ View)
2885 (SARLink™ View)

Y1-03-0244, Rev. B

USA · CANADA · FRANCE · RUSSIA
COSPAS SARSAT

ACR Electronics, Inc. // 5757 Ravenswood Road // Fort Lauderdale // FL // 33312-6645
Tel: +1 (954) 981-3333 // Fax: +1 (954) 983-5087 // www.acrelectronics.com

About Cobham Life Support, ACR Products

Cobham Life Support, ACR Products www.acrelectronics.com, designs and manufactures a complete line of safety and survival products including EPIRBs, PLBs, AIS, SARTs, Strobe Lights, Life Jacket Lights, Search Lights and safety accessories. The quality systems of this facility have been registered by UL to the ISO 9001:2008 Series Standards. Recognized as the world leader in safety and survival technologies, ACR has provided safety equipment to the aviation and marine industries as well as to the military since 1956.

About Cobham plc

Cobham plc is an international company engaged in the development, delivery and support of advanced aerospace and defense systems for land, sea, air and space. The company has four divisions that collectively specialize in the provision of components, subsystems and services that keep people safe, improve communications and enhance the capability of aerospace and defense platforms.

CAUTION: Before proceeding to install, test or use your new ACR Electronics' product, please read this Product Support Manual in its entirety.

If you have questions regarding the contents of the manual or something not covered in the manual, please contact our Technical Service Department at ACR Electronics, Inc., Telephone +1 (954) 981-3333. You can also visit our website at www.acrelectronics.com and access the Frequently Asked Questions (FAQs) section for further information. If in the future you lose this manual, you may access and print a replacement on the ACR website.

Table of Contents

STEP ONE - REGISTERING YOUR BEACON _____ *4*

STEP TWO - HOW THE BEACON WORKS _____ *6*

STEP THREE - MAINTAINING YOUR PLB _____ *15*

APPENDIX A - ACCESSORIES _____ *19*

APPENDIX B - USER INTERFACE: SPECIAL ICONS _____ *21*

APPENDIX C - USER INTERFACE: DIGITAL DISPLAY- OPERATION ___ *22*

APPENDIX D - USER INTERFACE: DIGITAL DISPLAY - SELF-TEST ____ *25*

APPENDIX E - USER INTERFACE: DIGITAL DISPLAY -LONG GPS TEST _ *28*

APPENDIX F - THE COSPAS-SARSAT SYSTEM _____ *29*

APPENDIX G - TECHNICAL SPECIFICATIONS _____ *30*

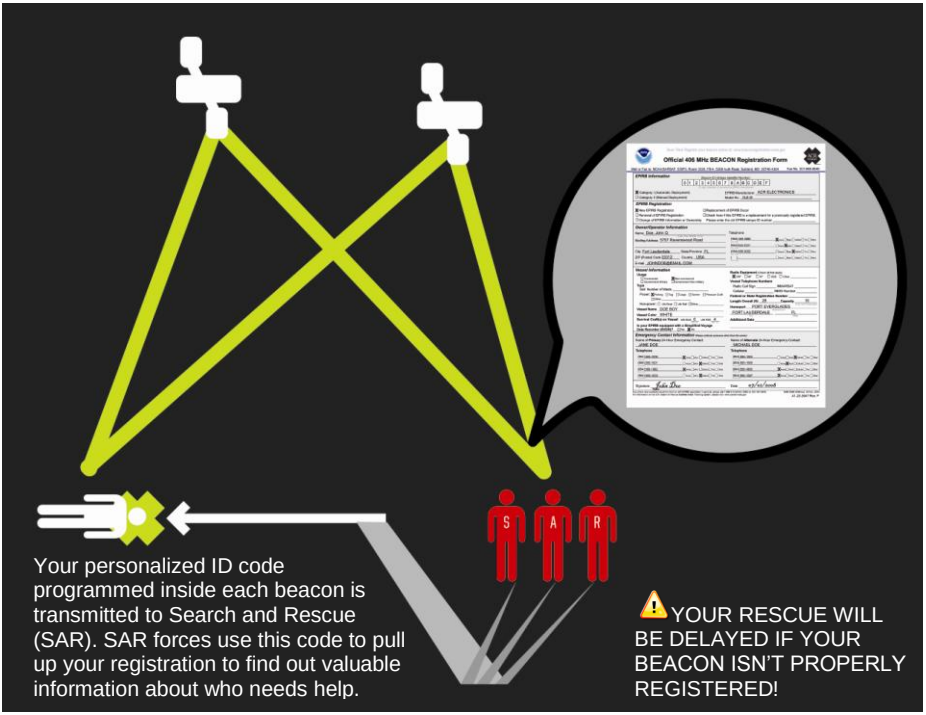
APPENDIX H - WARRANTY, USEFUL LIFE POLICY, NOTICES _____ *31*

APPENDIX I – RESTRICTIONS ON USE and EC DOC _____ *33*

PLEASE READ ALL WARNINGS, CAUTIONS AND NOTES CARFULLY

STEP ONE - REGISTERING YOUR BEACON
Why is registration important?

As the owner of this 406 MHz beacon, it is mandatory that you register it with the PLB national authority of your country: It is the law. Please note that all 406 MHz beacons are required to have their registration updated every two years by the owner.


Official 406 MHz BEACON Registration Form
S
A
R
Your personalized ID code programmed inside each beacon is transmitted to Search and Rescue (SAR). SAR forces use this code to pull up your registration to find out valuable information about who needs help.
YOUR RESCUE WILL BE DELAYED IF YOUR BEACON ISN'T PROPERLY REGISTERED!

HOW REGISTRATION WORKS:

All 406 MHz beacons transmit a Unique Identifier Number (UIN) when activated. This UIN is programmed into the beacon based on the country in which the beacon is registered, thus authorities are able to determine which country's database will have your registration information. SAR forces will have information as to who you are as the owner of the beacon, the name and type of vessel that you have (if applicable), your address, and who to contact that might know of your current situation - but only if your beacon has been properly registered. Valuable search and rescue resources are wasted every year responding to false alerts, and registering your beacon helps to resolve this quickly.

What country should I register in?
The beacon must be registered in the country of the owner's residence. If the beacon is not programmed to that country's code and protocol, and the residence is outside of the USA, the beacon needs to be reprogrammed.

Additionally, the beacon must be reprogrammed if you, as the owner, move out of the country where the beacon is registered. To verify the country for which a beacon is programmed, see the label with the UIN (Unique Identification Number) on the back of the unit.

How do I register?

Registration in the United States

The national authority that accepts registrations in the United States is the National Oceanic and Atmospheric Administration (NOAA).
There are three ways to register:

1. The fastest and easiest way to register is online at www.beaconregistration.noaa.gov/.

2. Faxing a registration is also acceptable. Fax the registration form to the fax number on the top of the registration form.

NOTE: Do not confuse the registration form with the ACR Electronics warranty card.

3. If online or fax registration is not available, mail the registration form with the pre-addressed, postage paid envelope to:

   Registration NOAA/NESDIS
   NSOF, E/SP3
   4231 Suitland Road
   Suitland, MD 20746

All registration forms will be entered in the 406 MHz beacon registration database within 48 hours of receipt. The information you provide on the registration form is used for rescue purposes only.

A confirmation letter, a copy of the actual registration and a proof-of-registration decal will be mailed to you within two weeks. When you receive these documents, **please check the information carefully,** and then affix the decal to your beacon in the area marked "BEACON DECAL HERE." **It is very important that the proof of registration decal matches the UIN on the beacon.** If you do not receive confirmation back from NOAA within two weeks, call toll free (888) 212-7283 for assistance.

Registration in Canada

Canadian residents can register online at: http://canadianbeaconregistry.forces.gc.ca/ or contact the Canadian Beacon Registry by phone at: 877-406-7671 or by fax at: 877-406-3298. Canadian registration forms can also be mailed to:

Canadian Beacon Registry
CFB Trenton, PO Box 1000 Stn Forces
Astra, Ontario K0K 3W0

Registration in Other Countries

In countries other than the United States and Canada, 406 MHz beacons are registered with that country's national authority at the time of purchase. The sales agent may have assisted you in filling out the forms and sending them to the country's national authority. Alternatively, many countries allow online registration in the International 406 MHz Beacon Registration Database (IBRD) at www.406registration.com.

To verify that the unit is properly programmed for your country, view the UIN label on the back of the unit. In the event that the beacon is not programmed for your country, the sales agent (if properly equipped) can reprogram the unit for the correct country.

STEP TWO - HOW THE BEACON WORKS

1. How your beacon summons help

406 MHz beacons are a type of portable emergency equipment that transmits a distress signal to search and rescue (SAR) organizations. The purpose of these beacons is to aid SAR teams in tracking and locating ships or individuals in jeopardy as rapidly as possible.

The 406 MHz frequency is a worldwide dedicated emergency frequency that is detected by a network of satellites called the Cospas-Sarsat system. This satellite system was established by, and continues to be supported by, its primary benefactors - the USA, Russia, Canada and France. The Cospas-Sarsat system has saved over 28,400 lives - and counting - since its inception. See Appendix or the Cospas-Sarsat website for more information about the system at www.cospas-sarsat.org.

When a 406 MHz beacon is activated, the digital distress message is sent to Cospas-Sarsat satellites and, in turn, the distress message is relayed to SAR. The distress message contains the beacon UIN and on some models the GPS location of the beacon. Additional information about the beacon is accessed by SAR from the beacon registration database. At the same time the 406 MHz signal is activated, a 121.5 MHz signal is turned on. The 121.5 MHz signal is used by SAR to home in on the beacon as they approach it.

The 406 MHz signal is detected by multiple satellites and from that information the location of the beacon can be calculated. This data alone is sufficient for SAR to find persons or ships in distress in a reasonable timeframe. However, as a further enhancement, some beacons have a GPS engine onboard. This feature allows the beacon to acquire current location coordinates from an internal GPS receiver. The purpose of this feature is to send an even more precise location of the beacon to the satellites, i.e., latitude and longitude data. This helps SAR to reach the location even faster.

2. Internal GPS position system

The PLB-350C is fitted with an internal GPS receiver that will download the coordinates (latitude and longitude) of the beacon's position on the globe, to be transmitted to the Cospas-Sarsat emergency system.

When the beacon is activated, the internal GPS immediately attempts to acquire positional coordinates. GPS coordinates can be acquired any time that the GPS is on, but only valid data is saved. Once the beacon acquires valid coordinates, the data is included as part of the next transmitted 406 MHz digital message.

The internal GPS operates on a schedule during a beacon activation. The GPS is on for a time, actively acquiring coordinates, and off for 20 minutes, in a standby state. The schedule is designed to conserve battery but, at the same time, assure that navigational coordinates are regularly updated.

3. Optional beacon management and testing services

Additional features and through satellite testing services are available for this beacon when you subscribe to the SafeLife System. When you sign up for this optional service you can test your beacon and have confirmation messages sent to your cell phone or email. Expanded services also will include friends and family contact information for check in messaging. Visit 406Link.com for complete details. (This service is not required for your beacon to function as a Personal Locator Beacon.)

4. Anatomy of your beacon

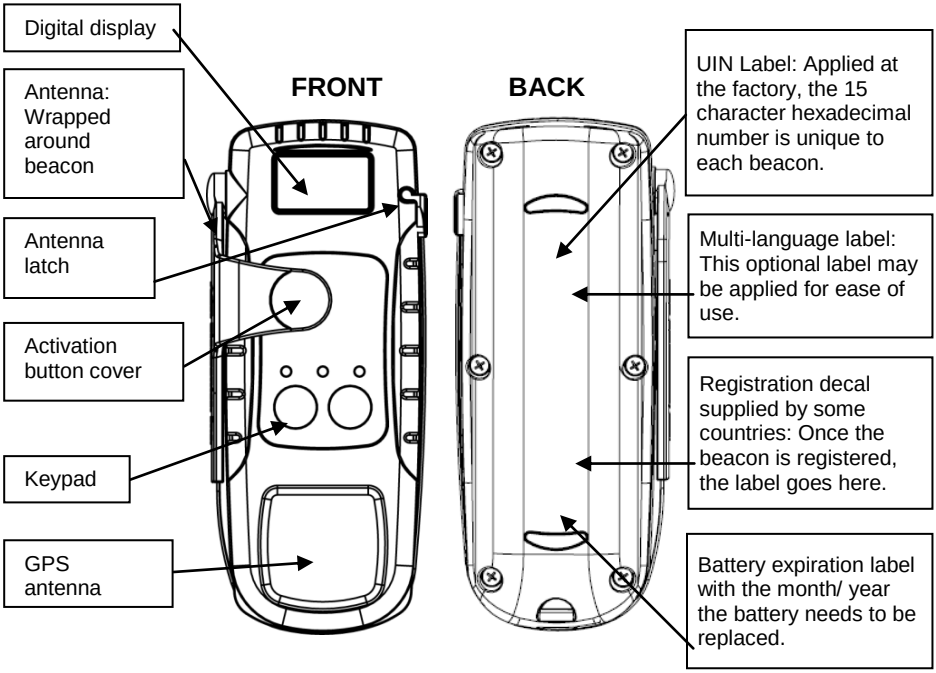

Digital display
Antenna: Wrapped around beacon
Antenna latch
Activation button cover
Keypad
GPS antenna
FRONT
BACK
UIN Label: Applied at the factory, the 15 character hexadecimal number is unique to each beacon.
Multi-language label: This optional label may be applied for ease of use.
Registration decal supplied by some countries: Once the beacon is registered, the label goes here.
Battery expiration label with the month/ year the battery needs to be replaced.

Figure 1

NOTE: The appearance of your beacon may vary from this picture.

5. Distinguishing PLB Features

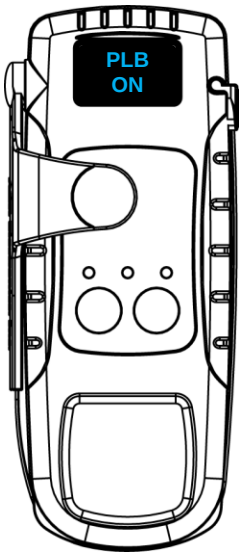
The distinguishing features available on your PLB vary with the particular model that you selected. The following table summarizes the similarities and differences in models.

PLB-350C		
Product names	AquaLink™View 406 GPS PLB	SARLink™ View 406 GPS PLB
ACR Product Number	2884	2885
Unique features	Digital display, LED strobe, 60 GPS acquisition tests	
GPS engine	Internal, 66-channel GPS receiver	
Top case	Clear	
Buoyant	Yes	No
Included Accessories	Attachment Clip	Multi-Function Belt Clip
Optional Accessories	Flotation pouch (ACR P/N 9504)	

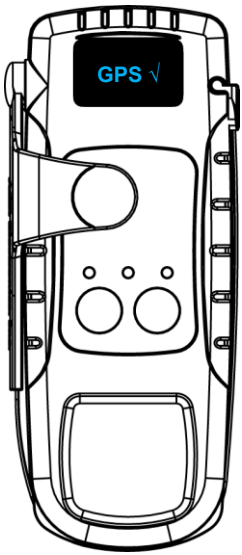
6. Digital Display

The digital display in the beacon is used as a secondary visual aid, supporting the green/red LED and the audio tone, which indicate the status of the beacon during testing and during emergency operation.

The messages on the digital display typically appear as one or two words at a time, until the entire message has been displayed.



When the beacon is activated, the display will show the message PLB ON. The beacon will begin to send 406 MHz emergency signal bursts, at which time the display provides other messages including 406 SENT, 121.5 ON and GPS coordinates, provided the data was acquired. If GPS data has not been successfully downloaded into the beacon, the digital display will give you tips like “GIVE CLEAR VIEW TO SKY.”



In Self-Test, the display illustrates the test result of each step with "√" indicating a pass and "X" indicating a failure. There are a total of five tests, including a battery check. If all tests pass, SELF-TEST PASS will be displayed at the end of the Self-Test mode. In the GNSS Self Test mode, the digital display will show the letters "GPS Test" moving left to right while the internal GPS receiver is acquiring the coordinate data. Once the data is acquired, the coordinates will display as a confirmation that the data was successfully acquired. This will be followed by the GPS coordinates horizontally scrolling through the display, provided the beacon has successfully downloaded an external GPS location. See Appendixes B through E for details about display messages.

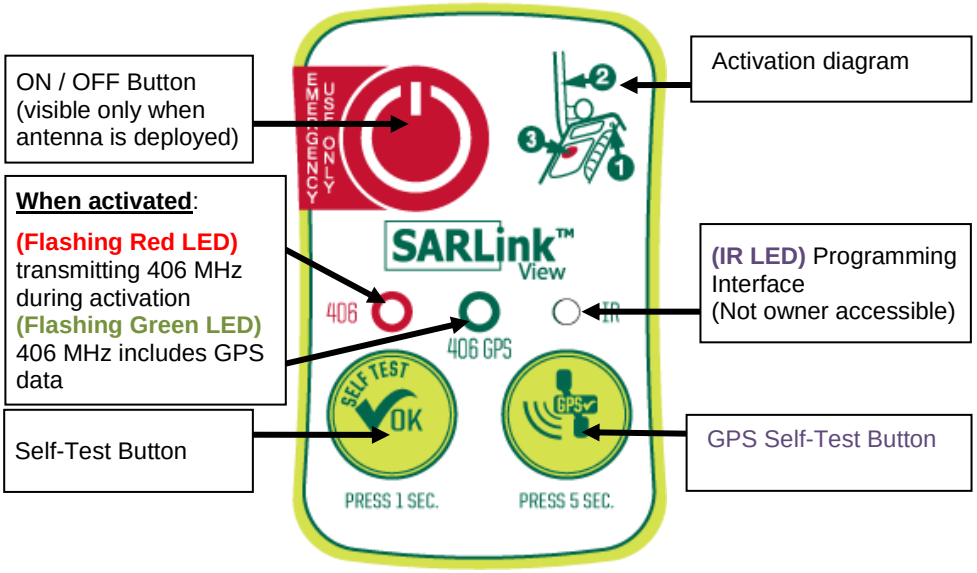
7. Activating your beacon

Warning: This transmitter is authorized for use only during situations of grave and imminent danger. Deliberate misuse may incur a severe penalty.

Overview

Personal Locator Beacons are designed to be manually activated. They are only to be activated when all other means of self-rescue have been exhausted. When properly registered as required, the activation of the beacon tells Search and Rescue who you are, where you are, and that you are facing a life threatening situation.

NOTE: The appearance of your key pad may vary from this picture.



PLB-350C

Figure 2 - Key Pad Functions

NOTE: If you notice the PLB is flashing the red or green LED and "beeping" periodically on its own, this likely means it has accidentally been activated and needs to be shut off and reported as a false alert see section on false alerts.

Steps to activate (406 MHz and 121.5 MHz)

To activate your beacon in a distress situation, follow these steps (see Figure 3 below).

1) Unclip the antenna from the case.
2) Move it into the upright position
3) Depress the ON/OFF ( ) button for 1 full second.

You will see the Red LED flashing and the display reads “PLB ON”. Your beacon is now activated. While transmitting your distress signal, the red LED will flash once every 2 seconds, alerting you that your beacon is active.

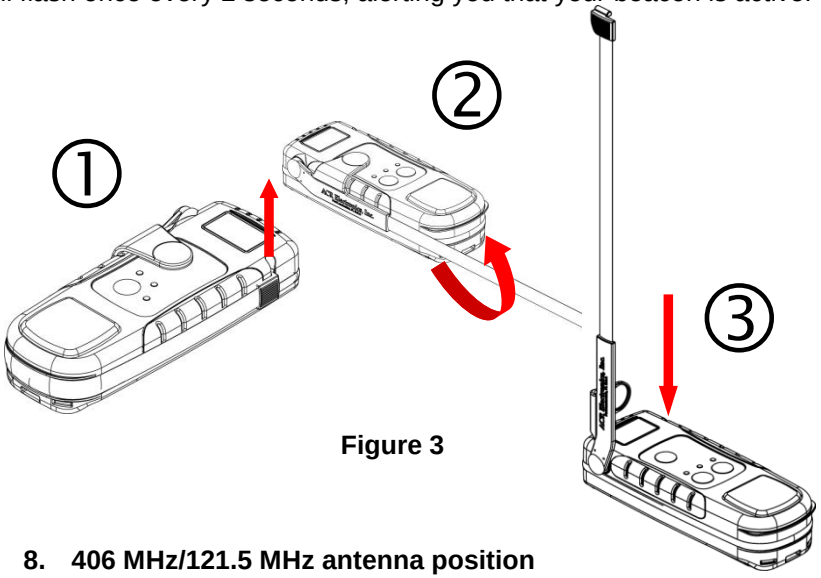


Figure 3

8. 406 MHz/121.5 MHz antenna position

For maximum performance you must deploy the beacon antenna into the proper position as shown in Figure 3. If at all possible, be sure the antenna is positioned facing the sky and avoid submerging in water. This device is intended to operate on or above the ground or while attached to your person **above the water line.**

9. Activation with GPS

If your unit is activated, the GPS receiver will start up, search to find your LAT/LON and incorporate it into your 406 MHz signal. As soon as the GPS receiver acquires valid positioning data, the red LED will stop blinking and the green LED will begin flashing once every 2 seconds.

The same GPS data will be sent with each 406 MHz signal for the next twenty minutes. At that time the internal GPS will start up again, search to find your LAT/LON and incorporate it into your next 406 MHz signal. If for any reason the internal GPS cannot update your LAT/LON, your last position will be used for the next four hours. At that time the green LED will stop blinking and the red LED will flash once every 2 seconds until new GPS data is obtained.

10. GPS receiver orientation

When activated, it is critical that you do not cover the beacon with any body part, water, clothing, etc. The GPS receiver is located under the bottom portion of the case behind the ACR Electronics' logo (see Figure 4).

To ensure optimum performance of the GPS receiver, the beacon needs to have an unobstructed view of the sky. Avoid submerging the GPS receiver in water if possible. Water will shield and inhibit the GPS receiver and may cause difficulties obtaining your GPS coordinates. Avoid leaning over the beacon to view blinking LED as you may shield the GPS reception.

Figure 4 – GPS Receiver Location

11. Turning off the beacon

To deactivate your beacon; depress the ON/OFF ( ) button for more than 4 seconds. Once the beacon is deactivated, all blinking LED's will stop, signifying that the beacon is no longer sending your distress message.

If deactivation should fail, remove the six screws holding the unit together and unplug the battery to disable the unit. Return the beacon to ACR Electronics for service.

NOTE: Leave beacon on until rescued. Turning beacon off will prolong or prevent rescue. Repeated activations could be viewed as a hoax.

12. Preventing false alerts

A false alert is any activation of the beacon, intentional or otherwise, that does not result from a situation of grave and imminent danger.

Be sure to do the following to help minimize false alerts:

// **Register your beacon.** This does not reduce false alert rates; however, when the beacon is properly registered, the situation can usually be resolved with a phone call.
// **Be careful with whom you leave your beacon.** Make sure that they know how to use it, and that they understand the ramifications of causing a false alert. A lot of false alerts are generated by curious individuals. If you notice the beacon is flashing the red or green LED and "beeping" periodically on its own, this likely means it has accidentally been activated and needs to be shut off and reported.
// **Do not stow beacon while other gear is in contact with the keypad.**

The Cospas-Sarsat satellites detect distress beacon transmissions immediately and locate the transmission within a few minutes of beacon activation.

NOTE: If you report a false alert and the authorities have not received the signal, do not be concerned. This may mean that you were able to deactivate the beacon before transmitting the signal.

13. False alert

A false alert **must** be reported to the search and rescue authorities.

False alerts in the USA that are rectified must be reported to the US Air Force Rescue Coordination Center (AFRCC) to let them know that the situation has been corrected and everything is fine. Responsibly reporting these events to the AFRCC or your proper authority will not incur a penalty, but deliberate misuse or not notifying the proper authority may incur a severe penalty.

<u>Reporting</u>
Should there be a false alert for any reason, it **must** be reported to the nearest search and rescue authorities. The information that should be reported includes:
// The PLB 15-digit Unique Identifier Number (UIN)
// Time and date
// Duration and cause of activation
// Location of beacon at the time of activation

To report false alert in the United States**,** contact the AFRCC:

United States Air Force Rescue Coordination Center (AFRCC) Tel: 1-800-851-3051

To report false alerts outside of the USA, contact the national authority where your beacon is registered.

STEP THREE - MAINTAINING YOUR PLB

1. Routine Maintenance

Carefully inspect the beacon case for any visible cracks. Cracks may admit moisture, which could falsely activate the beacon or otherwise cause a malfunction. Any cracks observed should be immediately referred to ACR for evaluation by calling +1 (954) 981-3333. ACR Technical Support can also be reached by sending an email to **service@acrelectronics.com**.

After checking the beacon case for cracks, it may be wiped down with a clean, damp cloth. Do not use any type of cleaner on your beacon.

2. Battery Replacement

Replace the battery no later than 6 years from date of manufacture, 5 years from date of install, or after emergency use. At each inspection, check the time remaining until replacement is required. The battery should be replaced if the beacon has been activated for any use other than the Self-test. Always refer battery replacements and other beacon service to a factory authorized Battery Replacement Center. Battery replacement includes servicing the beacon by replacing all o-rings, testing the water seal and the electrical properties.

NOTE: There are no user serviceable items inside the beacon. DO NOT OPEN THE BEACON. Opening the beacon will void the warranty.

For the nearest location of a Battery Replacement Center, visit our website at **www.acrelectronics.com**. Click on “Battery Replacement Center”.

This beacon contains two (2) lithium metal battery packs that are less than 2 grams each. They are not classified as Hazmat for transportation. Prior to shipping beacon for service, alert your carrier about the batteries contained in this equipment to make sure they properly label your package. Call ACR’s Technical Service department at +1 (954) 981-3333 for proper shipping instructions or visit the ACR website in the Support section entitled “Hazmat, MSDS Sheets, & Info”.

3. Self-test

ACR strongly recommends performing the **Self-test once per month**, or at least two weeks prior to a trip allowing enough time for service should your beacon require it.

A Self-test is initiated by holding the Self-test button for at least ½ second and **less than 5 seconds**.

Your beacon will flash the green LED to signify the test has begun and the Digital Display will show Pass or Fail message. The green LED will flash a second time to indicate that the self test was successful.

Components Tested: Data Integrity and Memory; 406 MHz Synthesizer; RF Power/Battery; GPS header

If a red LED flashes at the completion of the Self-test, your beacon has failed. Repeat the Self-test. If the failure persists, contact ACR Electronics or an authorized Battery Replacement Center for servicing of your beacon.

NOTE: During a Self-test your beacon will send a 406 MHz signal coded as Self-test to the satellite system. The 121.5 MHz homing signal is inhibited during Self-test; this allows you to test your beacon any time during the day without causing false alerts.

Self Test Sequences	**Self Test Guide** (Green LED Red LED)
Green LED, Display 4 Passes, Green LED	Successful Self-test
Green LED, Less than 4 Passes, Red LED	Failed Self-test – Return beacon to ACR
Red LED, Display 4 Passes, Green LED	Successful Self-test – At least 1 hour of battery power has been depleted, have battery replaced.
Red LED, Less than 4 Passes, Red LED	Failed Self-test – Return unit to ACR for service.

4. Battery Witness Seal Life

If your beacon flashes an initial red LED at the beginning of the Self- test, this indicates that your electronic witness has been broken and you have used more than 1 hour of battery life. While the beacon will still operate normally in a distress situation, ACR strongly recommends you have your battery replaced and the electronic witness reset to ensure that you will have 24 hours of battery power.

5. GPS Testing (GNSS Self-Test)

This test is NOT required as 100% of all GPS receivers that leave ACR have been tested to ensure they perform correctly. However, if you would like to ensure your GPS receiver is working, please follow these instructions very closely.

CAUTION: For PLB-350C models, the following test **can not be performed more than sixty times** during the life of the battery pack. Once this GPS testing feature reaches 60 times, the feature will be disabled by internal software.

NOTE: The GPS receiver is located under the bottom front portion of the case. It is imperative that the receiver is not obstructed during Self-test or activation to ensure that the GPS receiver is acquiring your latitude (LAT) and longitude (LON) position. This test must be performed outside with a clear view of the sky.

Press the GPS button for longer than 5 seconds. Observe the beacon for the entire GPS test. A green LED will indicate that the GPS has been turned ON. The beacon GPS will remain ON until LAT/LON coordinates have been obtained or until 2 minutes have elapsed. If good LAT/LON data has been obtained, a single 406 MHz test burst will be sent out with location data and the GPS will be turned OFF and the green LED will light for at least 3 seconds. This LAT/LON data is not saved for use. The green LED indicates that the GPS is functioning properly and that the beacon is in a location or environment where it can receive the necessary signals from satellites. If the GPS does not acquire good LAT/LON data, the GPS will turn OFF after 2 minutes, followed with a RED LED light up for 3 seconds, and no 406 MHz burst sent out.

GPS Test Sequences (maximum duration 121 seconds)	GPS Test Guide
Green LED at start followed by “GPS TEST” displayed, Green LED and LAT/LON displayed	Successfully acquired GPS data, 406 MHz burst sent out with location data
Green LED at start followed by “GPS TEST” displayed, Red LED	GPS data was not successfully acquired, no burst sent out.

6. Changing ownership or contact information

As the owner of the beacon, it is your responsibility to advise the national authority of any change in your registration information. If you are transferring the beacon to a new owner, you are required to inform the national authority. You can do this by using their online database or by letter, fax or telephone and informing the authority of the name and address of the new owner.

The new owner of the beacon is required to provide the national authority with all of the information requested on the registration form. This obligation transfers to all subsequent owners. See earlier section, STEP ONE, for further details on this process.

7. Lost or stolen PLBs

If your PLB is lost or stolen, do the following immediately:

// Report to your local authorities that the PLB has been lost or stolen

// Contact NOAA at (888) 212-7283 (212-SAVE), or your national authority, with the following information:

- Police department name
- Police department phone number
- Police case number

If your PLB were to be activated, the information you provided will be forwarded to the appropriate search and rescue authorities who will ensure that your PLB gets back to you. If someone attempts to register a PLB reported as stolen, NOAA or your national authority will notify the appropriate police department.

APPENDIX A - ACCESSORIES

1. Multi-Function Belt Clip

The SARLink™ View comes standard with a multi-function belt clip. To install the clip, simply align the bottom tabs on the clip with the insert holes located on the bottom of the beacon. Snap the clip in place by pressing the top of the clip so that the two top tabs engage in the two insert holes on the top of the beacon (see Figure 5). To remove the clip, push up and back on the top tabs one at a time to disengage the clip from the beacon.

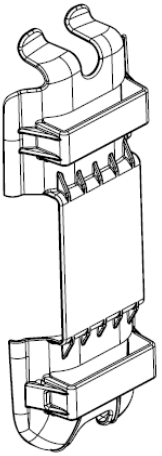


Figure 5 - Belt Clip

The belt clip has been designed to accommodate your extreme adventures.

You can secure your beacon directly to backpack webbing straps, life jackets or belts to ensure the beacon is close at hand. ACR recommends that you secure your beacon someplace on your person that is easily accessible in case of an emergency for rapid activation. Ensure the beacon is secured firmly and is protected before heading out to avoid damage or loss.

NOTE: ACR recommends that once you have clipped your beacon in place that you also anchor the beacon with the lanyard to your life jacket, backpack, etc. to ensure the unit will not be lost if it should break out of the clip.

2. Attachment Clip

The AquaLink™ View comes standard with an attachment clip. To install the clip, simply align the bottom tabs on the clip with the insert holes located on the bottom of the beacon. Snap the clip in place by pressing the top of the clip so that the two top tabs engage in the two insert holes on the top of the beacon (see Figure 6). To remove the clip, push up and back on the top tabs one at a time to disengage from the beacon.

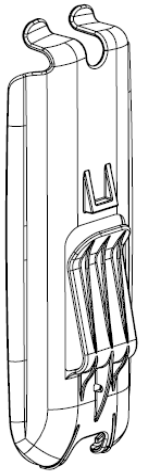


Figure 6 – Attachment Clip

This clip has been designed to secure your beacon directly to life jacket webbing straps or belts to ensure the beacon is close at hand. ACR recommends that you have a strap on your life jacket in the shoulder area for attachment of the PLB. The beacon should hang with the GPS receiver up (so that the beacon is inverted). This will give the GPS receiver the best possible view of the sky. It is also recommended that you try your life jacket on in the water to see how you float in it and where to best locate the beacon so that the beacon is not in the water. You may choose to carry your beacon in a pocket but you should have a strap installed on your life jacket to attach the beacon when it is activated. This will leave your hands free while treading water.

> **NOTE:** ACR recommends that once you have clipped your beacon in place that you also secure the beacon with the lanyard to your life jacket, backpack, etc. to ensure the unit will not be lost if it should break out of the clip.

APPENDIX B - USER INTERFACE: SPECIAL ICONS

Characters displayed during beacon operation include the following:

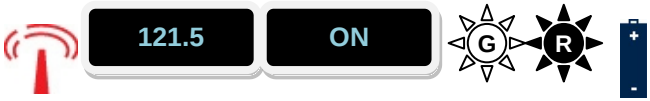
	The battery gauge appears on certain screens to indicate the remaining level of battery charge The gauge illustrates the remaining charge in the battery as a percent of the total possible charge, e.g., The gauge will show the system to be charged in the following increments: 100, 75, 50 and 25%.
	The frequency transmission symbol appears on certain screens to indicate that the transmission has been sent
	The symbols for a green or a red LED light, respectively
	Indicates scrolling text

APPENDIX C - USER INTERFACE: DIGITAL DISPLAY DURING OPERATION

The following chart describes the audio-visual feedback the beacon provides during activation. The messages on the digital display typically appear as one or two words at a time, until the entire message has been displayed.

AuquaLink™ View and SARLink™ View display, LED/ Audio Signaling and Description of Operation
 The beacon has been activated and the ACR Electronics Welcome Page appears
 The system reports that the beacon is on and in activation mode
 The system reports that the beacon has turned on the GPS engine
 The system reminds you that for optimum GPS performance, i.e., greatest likelihood of acquiring coordinates, position the beacon so that it has a clear view of the sky.
 The system reminds you that for optimum transmission of the emergency message, allow the beacon to float and do not hold the antenna (aerial).
 The system reports that the 406 MHz emergency message has been sent. If this message accompanied by a green LED flash, the GPS coordinates have been sent as well. If accompanied by a red LED flash, the GPS coordinates have not been sent. **NOTE:** If GPS coordinates were not sent, the system will continue to attempt to acquire the data and add it to the 406 MHz distress signal when available. Updated GPS coordinates are sent every twenty minutes.

This message appears only if GPS data was acquired



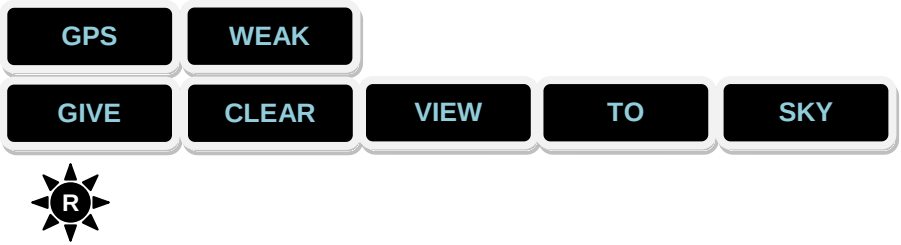
The system reports that the 121.5 MHz homing signal is on. Search and Rescue (SAR) personnel use this frequency when arriving close to the scene.

If this message is accompanied by a green LED flash, the GPS coordinates have been sent. If accompanied by a red LED flash, the GPS coordinates have not been sent.

NOTE: If GPS coordinates were not sent, the system will continue to attempt to acquire the data and add it to the 406 MHz distress signal when available. Updated GPS coordinates are sent every twenty minutes.

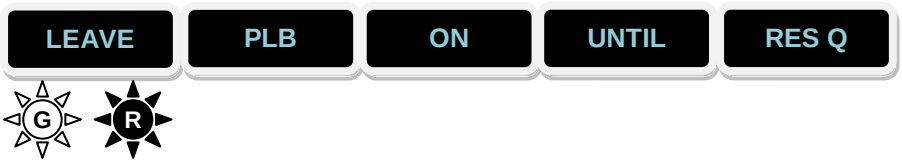
The system reports recently acquired GPS coordinates. You may be able to communicate the coordinates to SAR or other persons assisting in the rescue. The green LED flash indicates that GPS coordinates have been sent.

Coordinates will scroll from right to left with the following information: LT: XXº XX.XX',N and LG: XXXº XX.XX',W



The system alerts you that the GPS coordinates have not been acquired and therefore have not been sent.

The system reminds you that GPS data acquisition is optimized by giving the beacon a clear view of the sky.



The system reminds you that leaving the beacon on continuously gives the best assurance of being rescued. SAR groups need the ongoing transmissions from the beacon to most effectively find you.

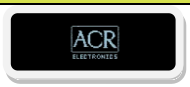
If this message is accompanied by a green LED flash, the GPS coordinates have been sent. If accompanied by a red LED flash, the GPS coordinates have not been sent.

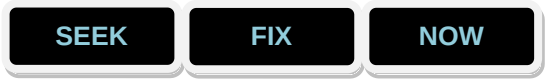
NOTE: If GPS coordinates were not sent, the system will continue to attempt to acquire the data and add it to the 406 MHz distress signal when available. Updated GPS coordinates are sent every twenty minutes.

The system reminds you that optimum performance of the beacon is achieved when the antenna is pointed up and the keypad and GPS have a clear view to the sky.

APPENDIX D - USER INTERFACE: DIGITAL DISPLAY DURING SELF-TEST

The following chart describes the display and audio-visual feedback the beacon provides during Self-Test. The messages on the digital display typically appear as one or two words at a time, until the entire message has been displayed.

AquaLink™ View and SARLink™ View Display, LED/ Audio Signaling and Description of Operation
 Beacon Self-Test has been initiated, and the ACR Electronics' Welcome Page appears.
 The first test checks the available hours of battery life (battery witness seal). If remaining battery life is greater than 24 hours at -20° C, the test passes.
 The first test checks the available hours of battery life (battery witness seal). If remaining battery life is less than 24 hours at -20° C, the test fails.
 The second test checks the beacon message for absence of errors (EEPROM memory). If no errors are present the test passes.
 The second test checks the beacon message for absence of errors (EEPROM memory). If an error(s) is present, the test fails.
 The third test checks circuit board (lock circuit) functionality. If the board is performing properly, the board passes.
 The third test checks circuit board (lock circuit) functionality. If the board is not performing properly, the board fails.

	The fourth test checks for 406 MHz signal strength/RF power. If power is adequate the system passes.
	The fourth test checks for 406 MHz signal strength/RF power. If power is not adequate the system fails.
	The fifth test checks GPS engine readiness. If the GPS is ready the beacon passes.
	The fifth test checks GPS engine readiness. If the GPS is not ready the beacon fails.
	If all six tests pass, the system advises you that Self-Test passed.
	If one of the six tests fails, the system advises you that Self-Test has failed.
	This message appears if Self-Test failed. The system advises you to refer to this Product Support Manual (User Book) for information on what to do and who to contact.
	This message appears if Self-Test failed. The system advises you to seek service from an authorized Service Center. Not only should the beacon be fixed immediately, it also should not be placed into service until the problem is addressed. **NOTE:** "SEEK FIX NOW" has the same meaning as "FIX NOW"

This message appears if Self-Test has passed, but the battery is low. Take the beacon to an authorized Service Center for a battery replacement.

NOTES regarding Self-Test logic:

1.) When one of the tests fail, the system bypasses the remaining tests and goes to SELF-TEST FAIL

2.) The only exception to #1 is that if the battery fails, the other tests are still performed. The system will tell the user if there are other system failures by flashing SELF-TEST FAIL. If there are no failures other than battery life, the system flashes SELF-TEST PASS, then BATT LOW.

APPENDIX E - USER INTERFACE: DIGITAL DISPLAY DURING EXTENDED GPS TEST

The following chart describes the display and audio-visual feedback the beacon provides during extended GPS Test. The messages on the digital display typically appear as one or two words at a time, until the entire message has been displayed.

AquaLink™ View and SARLink™ View display, LED/ Audio Signaling and Description of Operation
LONG **GPS** **DATA** **TEST** **START** The system informs you that the extended GPS test has initiated.
GIVE **CLEAR** **VIEW** **TO** **SKY** The system reminds you that GPS data acquisition is optimized by giving the beacon a clear view of the sky.
GPS **TEST** The system informs you that the beacon is in the process of performing the extended GPS test. This message repeats for approximately 100 seconds while the GPS is acquiring data.
GPS **TEST √** The system informs you that the beacon has passed the extended GPS test.
LT: 26.03.033N LG: 80.10.066W The system provides the user with the GPS coordinates acquired during a successful test. Coordinates will scroll from right-to left.
NO **GPS ✖** The system informs you that the beacon has failed the extended GPS test after 10 minutes.
SEE **USER** **BOOK** This message appears if extended GPS test failed. The system advises you to refer to this Product Support Manual (User Book) for information on what to do and who to contact.
TEST **END** The system informs you that the extended test is complete, and that the system is entering shut down.

APPENDIX F - THE COSPAS-SARSAT SYSTEM

1. General overview

Beacons transmit to the satellite portion of the Cospas-Sarsat system. Cospas-Sarsat satellites are an international system that utilizes Russian Federation and United States' low altitude, near-polar orbiting satellites (LEOSAR). These satellites assist in detecting and locating activated 406 MHz satellite beacons.

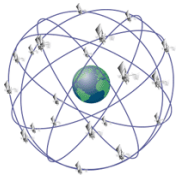
Cospas-Sarsat satellites receive distress signals from beacons transmitting on the frequency of 406 MHz. The Cospas-Sarsat 406 MHz beacon signal consists of a transmission of non-modulated carriers followed by a digital message format that provides identification data. The 406 MHz system uses satellite-borne equipment to measure and store the Doppler-shifted frequency along with the beacon's digital data message and time of measurement. This information is transmitted in real time to an earth station called the Local User Terminal (LUT), which may be within the view of the satellite, as well as being stored for later transmission to other LUTs.

The LUT processes the Doppler-shifted signal from the LEOSAR and determines the location of the beacon, then the LUT relays the position of the distress to a Mission Control Center (MCC) where the distress alert and location information is immediately forwarded to an appropriate Rescue Coordination Center (RCC). The RCC dispatches Search and Rescue (SAR) forces.

The addition of the GEOSAR satellite system greatly improves the reaction time for a SAR event. This satellite system has no Doppler capabilities at 406 MHz, but will relay the distress alert to any of the LUT stations. When there is GPS data included in the distress message, SAR authorities instantly know your location to within 110 yards (100 m). This speeds up the reaction time by not having to wait for one of the LEOSAR satellite to pass overhead. Because most of the search and rescue forces presently are not equipped to home in on the 406 MHz Satellite beacons signal, homing must be accomplished at 121.5 MHz.

Once the 406 MHz signal is relayed through the LEOSAR and/or GEOSAR network, SAR forces determine who is closest, and then proceed to the beacon using the 121.5 MHz homing frequency.

2. Global Positioning System (GPS)



The GPS system is a satellite group that enables a GPS receiver to determine its exact position to within 30 m (100 ft.) anywhere on earth. With a minimum of 24 GPS satellites orbiting the earth at an altitude of approximately 11,000 miles they provide users with accurate information on position, velocity, and time anywhere in the world and in all weather conditions. Beacons that have GPS engines add this data to its distress transmission, allowing search and rescue forces to narrow the search to a very small area, thus minimizing the resources required, and dramatically increasing the effectiveness of the overall operation.

APPENDIX G - TECHNICAL SPECIFICATIONS

406 MHz Transmitter	
Frequency	406 MHz
Output Power	greater than 5 watts (typical: 6.3 watts)
Frequency Stability	±2 parts per billion/100ms
Digital Message:	
Format	
Long message	Serialized[1*]
Message protocol	Standard Location
Duration	520 ms
Rate	400 bps
Encoding	Biphase L
Modulation	±1.1 radians peak
[1*] Beacons are shipped from ACR with a Serialized code but can be reprogrammed at a service center to other coded formats including nationality of registration.	
121.5 MHz Transmitter	
Frequency:	121.5 MHz
Frequency Tolerance	±50 ppm
Output Power	>25 mW PEP (typical 80mW)
Morse Code "P" ID	Every 50 seconds (approximately) (U.S. Protocol)
Modulation	
Type	AM (3K20A3N)
Sweep Range	400 to 1200 hZ
Sweep Rate	3 Hz
Duty Cycle	37.5%
Morse P	AM (2K00A2A)
Antenna	
Frequency	406.037 & 121.5 MHz
Polarization	Vertical
VSWR	Less than 1.5:1
General/Environmental	
Minimum Battery Operating Life	+24 hours minimum @ -4°F to +131°F (-20°C to +55°C)
Battery Replacement Interval	Battery replacement due no later than 6 years from date of manufacture, 5 years from date of install, or after emergency use
***Batteries meet the UN Classification for Non-dangerous goods**	
Size of beacon less Antenna	2.31 x 5.81 x 1.25 in (5.87 x 14.76 x 3.17 cm) (SARLink™ View) 2.31 x 5.81 x 1.45 in (5.87 x 14.76 x 3.68 cm) (AquaLink™ View)
Material	High-impact and UV-resistant plastic
Color	ACR-treuse™ (High-visibility yellow)
Weight	8.9 oz (252 g) without belt clip (SARLink™) 9.2 oz (260 g) without attachment clip (AquaLink™)
Strobe Light	Bright White, I flash per 3 seconds
Digital Display	Blue, 1 inch
Waterproof	Factory tested to 16.4 ft (5 m) for 1 hour and to 32.8 ft (10 m) for 10 minutes, both at room temperature
Buoyancy	See section 5 "Distinguishing PLB Features", page 8
Temperature Range	
Operating	-4°F to +131°F (-20°C to +55°C)
Storage:	-40°F to +158°F (-40°C to +70°C)

PLB-350C meets the requirements of Federal Communications Commission (FCC) Part 95 Subpart K. For all other type approval information, please visit our website at www.acrelectronics.com.

APPENDIX H - WARRANTY, USEFUL LIFE POLICY, NOTICES

Limited Warranty

This product is warranted against factory defects in material and workmanship for a period of 1 (one) year* from date of purchase or receipt as a gift. During the warranty period ACR Electronics, Inc. will repair or, at its option, replace the unit at no cost to you for labor, materials and return transportation from ACR. For further assistance, please contact our Technical Service Department at ACR Electronics, Inc., 5757 Ravenswood Road, Fort Lauderdale, FL 33312-6645. Email: service@acrelectronics.com, Fax: +1 (954) 983-5087, Telephone: +1 (954) 981- 3333.

This warranty does not apply if the product has been damaged by accident or misuse, or as a result of service or modification performed by an unauthorized factory. Except as otherwise expressly stated in the previous paragraph, THE COMPANY MAKES NO REPRESENTATION OR WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, AS TO MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR ANY OTHER MATTER WITH RESPECT TO THIS PRODUCT. The Company shall not be liable for consequential or special damages.

To place the warranty in effect, register online at www.acrelectronics.com or return the attached card within 10 days.

*Five years for the following products: EPIRB, PLB, S-VDR, SSAS.

Useful Life Policy

The typical service life of a properly maintained Product is limited to 12 years from date of manufacture. Products that are 12 years and 1 month or older from date of manufacture will not be serviced by ACR or our Battery Replacement Centers. A Product that is 12 or less years old from date of manufacture will be serviced as long as the unit appears fit to be placed back into its final operational cycle. Service includes the replacement of those items that must be replaced at service intervals and the verification that the device appears to be in good mechanical and electrical working condition by an ACR authorized service technician.

Notices

ACR Electronics diligently works to provide a high quality Product Support Manual, however, despite best efforts, information is subject to change without notice, and omissions and inaccuracies are possible. ACR cannot accept liability for manual contents. To ensure that you have the most recent version of the Product Support Manual, please visit the ACR website at www.acrelectronics.com.

©2010 by ACR Electronics, Inc., part of Cobham plc. All rights reserved. Reproduction in whole or in part is permitted only with permission of ACR Electronics, Inc.

Ongoing product improvements may change product specifications without notice.

Trademarks or registered trademarks are the property of their respective owners.

APPENDIX I – RESTRICTIONS ON USE and EC DOC

Europe – R&TTE Directive

The following countries place no restrictions on the use of this product:

- Austria
- Bulgaria
- Cyprus
- Czech Republic
- Denmark
- Estonia
- Finland
- Greece
- Iceland
- Ireland
- Italy
- The Netherlands
- Norway
- Portugal
- Romania
- Slovak Republic
- Sweden
- Switzerland/Liechtenstein
- United Kingdom

The following countries require a license for this product:

- France
- Germany
- Hungary
- Latvia
- Lithuania
- Luxembourg
- Spain

The following country only allows terrestrial use and requires a license for this product:

- Belgium

The following countries currently do not allow PLBs, including this product:

- Malta
- Slovenia

EC DECLARATION OF CONFORMITY

ACR Electronics, Inc. hereby declares that the following products are in conformity with Directive 1999/5/EC of the European Parliament and of the Council of 9 March 1999 on Radio Equipment and Telecommunications Terminal Equipment (R&TTE), and has been type examined as described in this Declaration. In accordance with the Directive, the product will be marked with the CE conformity marking as follows:

CE 0168①

Product: Personal Locator Beacon (PLB) with GPS Receiver
Trade Names: AquaLink™ View and SARLink™ View
Model: PLB-350C

Notified Body: BABT (British Approvals Board for Telecommunications), Notified Body No. 0168
Balfour House, Churchfield Road
Walton on Thames
Surrey, KT12 2TD, United Kingdom
Certificate No. NC/14625

Regulations and Standards:

EN 302 152-1: V1.1.1 (2003-11)	IEC 60950-1: 2006
EN 301 843-1: V1.2.1 (2004-06)	EN 60950-1:2001
EN 301 843-2: V1.2.1 (2004-06)	EN 62311: 2008
EN 301 489-1: V1.8.1 (2008-04)	ETS 300 487: 1996 + A1: 1997

COSPAS-SARSAT C/S T.001 – Issue 3 - Revision 9
COSPAS-SARSAT C/S T.007 – Issue 4 - Revision 3

Manufacturer:
ACR Electronics Inc.
5757 Ravenswood Road
Fort Lauderdale, FL 33312
USA

European Representative:
ACR Electronics Inc.
(European Office)
1 Rose Cottages, Pitmore Lane,
Sway, Lymington, Hampshire
SO41 6BX, United Kingdom

Signed on behalf of ACR Electronics Inc.

Signed:

Name: **Kerry Greer** **Date: February 15, 2010**

Title: **Executive Director – Research & Development**

Document PLB-350C-001

This Declaration complies with ISO/IEC 17050-1:2004

ACR Electronics, Inc. is registered by UL to ISO 9001:2000